Critical appraisal – Randomised controlled trial questions

Moreau et al. (2003) Clinical evaluation of a nutraceutical, carprofen and meloxicam for the treatment of dogs with osteoarthritis

Introduction	
Are the aims clearly stated?	Yes - to evaluate the efficacy, tolerance and ease of administration of carprofen, meloxicam and a nutraceutical product (containing glucosamine hydrochloride, chondroitin sulphate and manganese ascorbate) in order to identify the best treatment for dogs with osteoarthritis.
Methods	
Is the study design suitable for the aims?	Yes – randomised controlled trial (although a separate control group of dogs was recruited alongside those that were recruited for the trial to obtain normal ground reaction force GRF measurements)
Which population was studied?	71 dogs with clinically and radiographically confirmed osteoarthritis of the hips, elbows or stifles, recruited via telephone calls using the records of the veterinary teaching hospital (University of Montreal) or by newspaper
Were the treatments randomly allocated? If yes, how was the randomisation done?	Yes Using a computer-generated random list
Were the groups comparable prior to intervention?	The data in Table 4 shows which joints were affected in the dogs in each group (look roughly similar). States that at the beginning of the study the mean age, weight, affected limb ground reaction force (GRF) values, radiographic and subjective scores were similar (no statistical results given)
Was the person who administered the interventions blinded?	Not clearly stated.

Is it clear what measurements were carried out in the study?	Yes
Were the correct measurements chosen? Do they reflect (or are they strongly related to) the outcome of interest?	Yes – though validated outcome measures for this purpose have subsequently become available. Yes
Were previously established validated methods used to make the measurements? (e.g. Glasgow pain score, International Units etc)	A reference is given for the validation of the GFR assessment method, but subsequent studies since the publication of this paper have identified multiple variables that can affect results. The subjective owner and orthopaedic scores, and the radiological score used at baseline were not validated.
What outcomes were measured?	• Scoring system created by the owners – subjective owner assessment • Ground reaction force (GRF) via force plate • Visual examination and complete orthopaedic examination by a veterinary surgeon – combined into a subjective score • Radiographic score based on radiographs of joints • Blood samples for haematological and biochemical profiling; faecal samples for occult blood
Are the outcomes clinically relevant?	Yes
Were the outcomes assessed blind?	It states that the vets did not know which treatment group the dogs belonged to. Due to a difference in treatment preparations, it is unlikely the owners would have been blinded to the treatments given (although this was not stated)
Are the statistical methods described?	Yes
Was the statistical significance level stated?	Yes:

	1-7% significance level for the Wilcoxon signed-rank test 5% significance level for the Wilcoxon rank sum test
Was the sample size justified?	No
Was ethical approval obtained?	Yes
Are the methods described in enough detail that you could repeat them?	Further details would be useful on recruitment, what tests were conducted at what time point, the methods used for the orthopaedic scoring, and the exact GRF methodology.
Results	
Were the basic data adequately described?	A good level of data are reported about the dogs included but little other basic data is included. The results of the study relevant to this BET are described only in a one line summary.
Do the numbers add up? Are all subjects accounted for?	Yes, in terms of treatment allocation, but numbers are not provided in relation to any of the key results. Yes
Was the statistical significance (p value) stated in the results? Is this consistent with the methods? (It should be stated in the sample size or power calculation)	Yes Yes
Were any side effects of the intervention reported if applicable?	Yes - one dog in the carprofen group and one in the chondroitin-glucosamine-manganese group developed melena, and one dog in the carprofen group developed idiopathic hepatitis.
What were the main findings/key results?	Results relevant to this BET are very poorly reported. The authors report that dogs treated with chondroitin-glucosamine-manganese showed no significant response during the study, either in terms of the objective gait analysis (GRF) or both

	of the subjective assessments. However, no data are presented to support this. Some GRF values of dogs some treated with carprofen showed a significant improvement during the study, although values did not return to "normal". There was also a significant improvement in the subjective orthopaedic assessment of dogs treated with Carprofen at day 30 (summary data only presented), but no significant response in terms of the owners' subjective assessment (no data presented).
Discussion and conclusion	
What do the main findings/key results mean?	From this study it is very difficult to draw conclusions as the results relevant to this study about the nutraceutical group are reported only in a single summary sentence. The supplement didn't appear to have an effect. Carprofen demonstrated an effect at 30 days, but then levelled off
Are the negative findings discussed? How are the negative findings interpreted?	Yes, briefly, that the dose of nutraceutical may have been inadequate, and that the scores at baseline and 60 days were more similar than expected for Carprofen were perhaps due to the presence of inflammatory mediators not inhibited by NSAIDs. No mention of small sample size and the possible impact of this Discussed the effects of prostaglandin on the lack of response at 60 days but acknowledge the limitations of the scope of this argument
Does the discussion reflect the results?	Mostly
Interpretation	
What are the clinical implications of this study?	Only limited clinical implications can be drawn from this study due to its poor reporting, and

	because validated outcome measures of clinical relevance were not available when the study was performed. No improvement was demonstrated in the dogs' subjective osteoarthritis scores when treated with the nutraceutical which may suggest it has limited efficacy. However, with the small sample size and in the absence of a sample size calculation it is difficult to determine the significance of this result.
Are the subjects in the study similar to those in the BET/your own?	Yes.
General	
Who funded this study?	Boehringer Ingelheim – manufacturer of Metacam, a major brand of meloxicam.